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APPLICATION NO.	FILING DATE	FIRST NAMED INVENTOR	ATTORNEY DOCKET NO.	CONFIRMATION NO.
09/870,242	05/30/2001	Jitendra Singh Goela	51048-2 DIV (3568-33-000)	9573

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EXAMINER

EGAN, BRIAN P

ART UNIT	PAPER NUMBER
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1772

DATE MAILED: 12/27/2002

4

Please find below and/or attached an Office communication concerning this application or proceeding.

AS-4

<b>Office Action Summary</b>	<b>Application No.</b> 09/870,242	<b>Applicant(s)</b> GOELA ET AL.	
	<b>Examiner</b> Brian P. Egan	<b>Art Unit</b> 1772	

-- The MAILING DATE of this communication appears on the cover sheet with the correspondence address --

**Period for Reply**

A SHORTENED STATUTORY PERIOD FOR REPLY IS SET TO EXPIRE 3 MONTH(S) FROM THE MAILING DATE OF THIS COMMUNICATION.

- Extensions of time may be available under the provisions of 37 CFR 1.136(a). In no event, however, may a reply be timely filed after SIX (6) MONTHS from the mailing date of this communication.
- If the period for reply specified above is less than thirty (30) days, a reply within the statutory minimum of thirty (30) days will be considered timely.
- If NO period for reply is specified above, the maximum statutory period will apply and will expire SIX (6) MONTHS from the mailing date of this communication.
- Failure to reply within the set or extended period for reply will, by statute, cause the application to become ABANDONED (35 U.S.C. § 133).
- Any reply received by the Office later than three months after the mailing date of this communication, even if timely filed, may reduce any earned patent term adjustment. See 37 CFR 1.704(b).

**Status**

- 1) ☒ Responsive to communication(s) filed on 09 October 2002.
- 2a) ☐ This action is **FINAL**.                      2b) ☒ This action is non-final.
- 3) ☐ Since this application is in condition for allowance except for formal matters, prosecution as to the merits is closed in accordance with the practice under *Ex parte Quayle*, 1935 C.D. 11, 453 O.G. 213.

**Disposition of Claims**

- 4) ☒ Claim(s) 27-33 is/are pending in the application.
- 4a) Of the above claim(s) 20-26 is/are withdrawn from consideration.
- 5) ☐ Claim(s) \_\_\_\_\_ is/are allowed.
- 6) ☒ Claim(s) 27-33 is/are rejected.
- 7) ☐ Claim(s) \_\_\_\_\_ is/are objected to.
- 8) ☐ Claim(s) \_\_\_\_\_ are subject to restriction and/or election requirement.

**Application Papers**

- 9) ☐ The specification is objected to by the Examiner.
- 10) ☐ The drawing(s) filed on \_\_\_\_\_ is/are: a) ☐ accepted or b) ☐ objected to by the Examiner.  
Applicant may not request that any objection to the drawing(s) be held in abeyance. See 37 CFR 1.85(a).
- 11) ☐ The proposed drawing correction filed on \_\_\_\_\_ is: a) ☐ approved b) ☐ disapproved by the Examiner.  
If approved, corrected drawings are required in reply to this Office action.
- 12) ☐ The oath or declaration is objected to by the Examiner.

**Priority under 35 U.S.C. §§ 119 and 120**

- 13) ☐ Acknowledgment is made of a claim for foreign priority under 35 U.S.C. § 119(a)-(d) or (f).  
a) ☐ All b) ☐ Some \* c) ☐ None of:  
1. ☐ Certified copies of the priority documents have been received.  
2. ☐ Certified copies of the priority documents have been received in Application No. \_\_\_\_\_.  
3. ☐ Copies of the certified copies of the priority documents have been received in this National Stage application from the International Bureau (PCT Rule 17.2(a)).  
\* See the attached detailed Office action for a list of the certified copies not received.
- 14) ☐ Acknowledgment is made of a claim for domestic priority under 35 U.S.C. § 119(e) (to a provisional application).  
a) ☐ The translation of the foreign language provisional application has been received.
- 15) ☒ Acknowledgment is made of a claim for domestic priority under 35 U.S.C. §§ 120 and/or 121.

**Attachment(s)**

- |  |   |
|--|---|
| 1) <input checked="" type="checkbox"/> Notice of References Cited (PTO-892)                  | 4) <input type="checkbox"/> Interview Summary (PTO-413) Paper No(s). _____  |
| 2) <input type="checkbox"/> Notice of Draftsperson's Patent Drawing Review (PTO-948)         | 5) <input type="checkbox"/> Notice of Informal Patent Application (PTO-152) |
| 3) <input type="checkbox"/> Information Disclosure Statement(s) (PTO-1449) Paper No(s) _____ | 6) <input type="checkbox"/> Other: _____                                    |

## DETAILED ACTION

### *Election/Restrictions*

1. Applicant's election with traverse of Claims 27-33 in Paper No. 3 is acknowledged. The traversal is on the ground(s) that the examination of both inventions would not create a serious burden upon the Examiner since the searching of one group of claims would involve the searching of the other, because searching only two subclasses does not create a serious burden, and that the Examiner has provided no basis for concluding that the shell of claims 27 to 33 may be made by a molding apparatus. This is not found persuasive.

Whether or not only one class and subclass are distinguished on the restriction requirement is irrelevant. Restriction for examination purposes remains proper upon demonstration that the inventions comprise separate classifications. Here, it is clear that there are two distinct inventions – an apparatus and an article. Not only can the product be made by a materially different apparatus, the apparatus can be used to make a materially different product. Despite the applicant's contentions that a molding operation could not be used for this product, it is notoriously well known in the art that molding operations can be used in place of CVD operations. Although evidence is not necessarily needed to prove otherwise, the Examiner has provided the Applicant with a teaching of molding large silicone carbide structures (*See* LOW COST FABRICATION OF LARGE SILICON CARBIDE/SILICONE CARBIDE COMPOSITE STRUCTURES (last visited Dec. 18, 2002) at [http://es.epa.gov/ncer\\_abstracts/sbir/other/hazsolid/miller2.html](http://es.epa.gov/ncer_abstracts/sbir/other/hazsolid/miller2.html) (“A preceramic polymer, which is both inexpensive and stable in ambient environments, was infused into a fiber preform”)). Furthermore, the apparatus as claimed could be used to make a

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hollow structure of any ceramic or related material – it need not only be used to produce silicone carbide.

Therefore, the requirement is still deemed proper and is therefore made FINAL.

***Claim Rejections - 35 USC § 102***

2. The following is a quotation of the appropriate paragraphs of 35 U.S.C. 102 that form the basis for the rejections under this section made in this Office action:

A person shall be entitled to a patent unless –

(b) the invention was patented or described in a printed publication in this or a foreign country or in public use or on sale in this country, more than one year prior to the date of application for patent in the United States.

3. Claims 27-28, 30, and 33 are rejected under 35 U.S.C. 102(b) as being clearly anticipated by Matsumoto et al. (#4,999,228).

Matsumoto et al. disclose a hollow silicon carbide shell (see Figs. 1-2) having a ratio of external perimeter to wall thickness greater than 200 (Col. 5, lines 4-8: “the size of the diffusion tube base is not limited, although generally the inner diameter is in the range of about 80mm to about 250mm, the thickness is in the range of about 4mm to about 8mm...” Thus, the external diameter ranges from 258-266mm, therein resulting in an external perimeter in the range of 810.53-835.66mm while the thickness ranges from 4-8mm. The resulting ratio range of external perimeter:wall thickness is 101.32-208.915) that is cylindrical in shape (see Abstract – “tube”). The density of the silicon carbide is at least 3.15 grams per cubic centimeter (Col. 9, lines 27-34 – “a density of 3.0 g/cm<sup>3</sup> or over”).

***Claim Rejections - 35 USC § 103***

4. The following is a quotation of 35 U.S.C. 103(a) which forms the basis for all obviousness rejections set forth in this Office action:

(a) A patent may not be obtained though the invention is not identically disclosed or described as set forth in section 102 of this title, if the differences between the subject matter sought to be patented and the prior art are such that the subject matter as a whole would have been obvious at the time the invention was made to a person having ordinary skill in the art to which said subject matter pertains. Patentability shall not be negated by the manner in which the invention was made.

5. Claims 27-33 are rejected under 35 U.S.C. 103(a) as being unpatentable over Lu et al. (#5,904,778) in view of Sibley (#5,443,649).

Lu et al. teach a hollow silicon carbide shell (“composite silicone carbide article”; see abstract) having a ratio of external perimeter to wall thickness greater than 50 (“the overall dimensions of the chamber are relatively large, being about 15 inches... diameter” (Col. 5, lines 51-53) which corresponds to a perimeter of over 47 inches; “the sintered bulk part had a thickness of between 3/8” and 3/4” (0.375-0.75 inches) (this bulk part, Fig. 9, #74, corresponding to the wall structure in Fig. 1, #22) (Col. 12, lines 41-42); therefore, the ratio of external perimeter to wall thickness ranges from 62.67-125.33) that may be in a cylindrical (Col. 5, lines 45-46) or frustroconical shape (“radially varying, generally axially symmetric shape” (Col. 5, line 51)).

Lu et al. fail to teach a silicone carbide density of at least 3.15 grams per cubic centimeter, an external perimeter in excess of 50 or 65 inches, and an external perimeter to thickness ration of over 200.

Sibley, however, teaches the use of full density silicon carbide shells for semiconductor holding. Sibley teaches a silicone carbide density of at least 3.18 grams per cubic centimeter (Col. 8, lines 1-2). Sibley teaches the use of a full density silicon carbide for the purpose of

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providing an advantageous structure for the fabrication of electronic integrated circuits where high temperatures and/or corrosive chemicals are present wherein the structure provides high dimensional stability as well as prevents contaminating elements from affecting the process (see Abstract). It would have been obvious through routine experimentation to one of ordinary skill in the art at the time applicants invention was made to have provided an element used for semiconductor fabrication with full density silicone carbide for the purpose of providing an advantageous structure for the fabrication of electronic integrated circuits where high temperatures and/or corrosive chemicals are present wherein the structure provides high dimensional stability as well as prevents contaminating elements from affecting the process as taught by Sibley.

Therefore, it would have been obvious to one of ordinary skill in the art at the time applicants invention was made to have modified Lu et al. to include full density silicon carbide in the composite article as taught by Sibley in order to provide an advantageous structure for the fabrication of electronic integrated circuits where high temperatures and/or corrosive chemicals are present wherein the structure provides high dimensional stability as well as prevents contaminating elements from affecting the process. Lu et al. would have been motivated to make such an obvious modification based on Lu et al.'s desire to make an article for semiconductor fabrication (see Abstract).

Although Lu et al. fail to explicitly teach that the external perimeter is in excess of 65 inches and that the external perimeter to wall thickness ratio exceeds 200, it is clear from Lu et al.'s disclosure that such a modification would have been obvious to one of ordinary skill in the art. First, as previously mentioned, the diameter is relatively large at 15 inches (corresponding to

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a diameter of over 47 inches) (Col. 5, lines 52-53). Note that the Applicant contends that this measurement has no relation to the silicon carbide cylindrical wall. The Examiner respectfully disagrees. The Examiner agrees that the overall dimension of the chamber is 15 inches but since the cylindrical wall structures (22) extend to the outermost point of the chamber structure, the wall structures encompass the 15 inch dimension. Second, this measurement is only in relation to the formation of 200mm diameter wafers (Col. 5, line 54). Lu et al. further teach that the chamber structure can be modified to handle 300mm diameter wafers (Col. 5, line 54-55). Given that this constitutes a 50% increase in wafer size, under the contention that wafer size and chamber size are linearly related, the chamber would have to be increased to a perimeter of 70.5 inches. Lu et al. state that the increase in size here is slightly exacerbated, but that the technology of forming large, strong, shaped bodies of silicon carbide is well developed (Col. 5, lines 54-56). Therefore, even if the Applicant's contend that the size of the chamber structure and wafer size are not linearly related, increasing the size of the chamber structure above 47 inches in diameter would entail a re-sizing that is notoriously well known and within the skill of those of ordinary skill in the art.

Furthermore, increasing the perimeter of the structure (therein increasing the external perimeter:wall thickness ratio) would have been obvious to one of ordinary skill in the art at the time applicants invention was made since such a modification would have involved a mere change in the size of a component. A change in size is generally recognized as being within the level of ordinary skill in the art. *In re Rose*, 105 USPQ 237 (CCPA 1955).

The Applicant's have provided no threshold requirements within the specification to demonstrate any sort of unexpected results between a shell that is 47 inches in diameter as

opposed to 50 or 65 inches in diameter. Absent such a demonstration, it is concluded that based on the teachings of Lu et al., it would not only have been obvious to increase the perimeter size, but that such a modification is a well developed practice in the art.

### ***Response to Remarks***

6. Applicant's arguments with respect to claims 27-33 have been considered but are moot in view of the new ground(s) of rejection.

7. As to the previously rejected Claims 27-27, 30 and 33 under 35 U.S.C. 102(e) over Lu et al. (#5,904,778) from the previous office action, the Examiner agrees that claiming inherency upon the density of the silicone carbide was improper. The Examiner has therefore withdrawn the rejection from the previous office action.

8. As to the previously rejected Claims 27-33 under 35 U.S.C. 103(a) over Karni et al. (#5,323,764), the Examiner agrees that claiming inherency upon the density of the silicone carbide was improper. Furthermore, the Examiner agrees with the Applicant's contention that it would not have been obvious to modify both the external perimeter and wall thickness to be in conformance with the Applicant's claimed invention. The Examiner has therefore withdrawn the rejection from the previous office action.

### ***Conclusion***

Any inquiry concerning this communication or earlier communications from the examiner should be directed to Brian P. Egan whose telephone number is 703-305-3144. The examiner can normally be reached on M-F, 8:30-5.



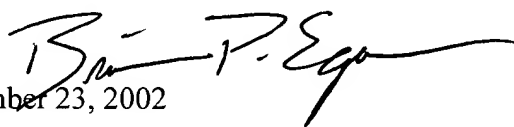
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If attempts to reach the examiner by telephone are unsuccessful, the examiner's supervisor, Harold Y. Pyon can be reached on 703-308-4251. The fax phone numbers for the organization where this application or proceeding is assigned are 703-872-9310 for regular communications and 703-872-9311 for After Final communications.

Any inquiry of a general nature or relating to the status of this application or proceeding should be directed to the receptionist whose telephone number is 703-308-0661.

BPE  
December 23, 2002

  
HAROLD PYON  
SUPERVISORY PATENT EXAMINER  
1772 12/24/02